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Animal Husbandry in India*

By

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[PRINCIPAL, ROYAL (DICK) VETERINARY COLLEGE, EDINBURGH, AND FORMERLY ANIMAL HUSBANDRY EXPERT TO THE GOVERNMENT OF INDIA]

It would be impossible to gain a clear idea of the complexity of the problems which have to be faced without some understanding of the special factors by which animal husbandry is conditioned in India; for example:—

1. Religious and traditional prejudices and customs.
2. The effect of the density of the population and the low purchasing power of the cultivators on farming practice.
3. The general lack of appreciation of the fundamental principles which underlie proper breeding, feeding and management, and the great need which exists for a properly balanced system of land utilisation.
4. The lack in most Provinces and States of any expert animal husbandry organisation devoted solely to the interests of livestock.
5. The annual droving of millions of dealers' cattle from north to south of India.

Slaughter.—The cow is a semi-sacred animal and cannot be slaughtered, and in strict Hindu communities it is not permissible to give a merciful release even to a fatally injured and suffering animal. These inhibitions are productive of the most far-reaching difficulties and make it impracticable to carry on dairying or stock breeding on strictly commercial lines.

Castration.—Until comparatively recently stock owners were unwilling to castrate their cattle at an early age, though the males and females run together on village grazing grounds. This objection is now being overcome, and castration of inferior animals is carried out on a large scale by provincial veterinary departments. It cannot, however, be too much or too often emphasised that no lasting progress can be expected in livestock improvement until arrangements are made for controlled mating and the proper feeding and management of breeding females and young stock.

Grazing Areas.—Though highly desirable, the improvement of such grazing areas as remain is not a solution of the cattle feeding problem. The best of these areas tend to be taken up for cultivation and in any case, cultivators ought to aim at devoting a portion of their holdings to fodder crop production, thereby producing better stock and more milk, and helping to maintain the fertility and physical condition of the soil. Without such a change of system—where necessary—progressive degeneration of cattle seems certain to follow the gradual disappearance of the good grazing lands on which the better cattle are at present bred.

Pinjrapoles and Gaushalas.—The semi-religious pinjrapoles and gaushalas which are maintained in most cities throughout India have in many cases become anything but the homes of rest and comfort for derelict animals they are intended to be. By arranging for competent management and by breeding from the best of the cows and selling their milk, it was shown that conditions could be greatly improved and profits made. It was also shown that by taking up land for cultivation outside the city the extra funds thus obtained could be utilised to great advantage to provide fodder crops and grazing for the hopelessly derelict, and better feeding for the milking herd and young stock. By using selected sires, valuable young bulls were also produced which should be of considerable value to breeders in the vicinity. These institutions could thus be made valuable demonstration centres all over India and in addition to their great educational value would save large numbers of quite good milch cows which are committed to their care.

Density of Population.—Owing to the smallness of the holdings and the low purchasing power of the individual, it has generally been considered impracticable for the Indian ryot to produce fodder crops for the proper feeding of his cattle, or to produce or purchase the increased supplies of milk which are essential for the health and proper development of the people. The tendency has been to consider that the only practicable policy is to produce more and more crops for sale or direct human consumption. As a result, soil fertility and humus content have been greatly depleted in many areas and enormous damage is being done by denudation, owing to removal of cover and humus from the soil. There seemed, however, to be no reason why by a suitable system of mixed farming the ryots, in suitable areas, should not obtain as great money returns as under the present system of devoting their entire holdings to crops, and in addition, better stock and an invaluable supply of milk and dairy products for their families. Experiments undertaken to test this view have in fact shown that by substituting mixed farming, including milk production, for the mere raising of crops for sale, agriculture in many parts of India could be raised to a higher level.

Dung Burning and the Manurial Value of Livestock.—Throughout the drier parts of India the custom of burning cow dung for fuel is a serious handicap to agriculture. A great deal of manurial value is lost; the soil is deprived of humus; and as cattle are not usually herded on the land due for cultivation, the manurial value of their urine is also lost.

Moreover, under the present system, village grazing grounds become so trodden and infected with disease that it is impossible to breed or maintain any but the most stunted stock on them.

In the absence of available firewood, the burning of cow dung seems bound to continue, but it is clear that more of their manurial value could be made available for crop production if cattle were better fed and maintained on the holdings, wherever possible.

Breeding Practice and European Cattle.—Except amongst the expert breeders, who are dying out as the best of the grazing areas are taken up for arable cultivation, there is little tendency to ensure systematic mating to produce definite types, and one of the great dangers of importing European cattle into India is that the male crossbred progeny are used indiscriminately as sires. It has now been shown that the better Indian breeds of milch cattle can easily be improved to a relatively high standard by proper breeding, feeding and management. To control such work among the 200 million livestock of India, organised animal husbandry is, however, essential, to take the place of these professional breeders. Otherwise sires of mixed or unknown parentage will be more and more used, though it is now well known that their progeny is very inferior.

Buffalo or Cow.—Much more highly fed as it usually is, the she-buffalo is generally considered to be a far more efficient milk and butter fat producer than the cow, but a careful analysis of available data showed that this is probably only true where an abundance of coarse grazing is available. Indeed, strictly assessed in relation to the relatively high value in nutrition of the solids-not-fat of milk and with due regard to the need for a correctly balanced diet for the people, it is probable that for home production the balance would favour cows of the best Indian milch breeds. Under parallel conditions of feeding and management such cows produce as much milk as, or more than, buffaloes, and though the percentage of butter fat is lower, the Zebu cow is highly efficient in converting dry crop residues into food of high biological value, and can even produce butter fat as cheaply as the buffalo. For commercial dairying the buffalo has obvious advantages, but it is difficult to feel that the custom of maintaining she-buffaloes for milk production as well as cows for the production of working bullocks can be economically sound in rural areas.

Calf Rearing.—Female buffalo calves are usually well fed and reared, while most of the males are allowed to succumb. In the case of cows the opposite happens, and in both species it is the custom to present the stuffed hides to the cows at milking time to induce them to give their milk. In recent years it has, however, been shown that with proper handling when first brought into the milking herd, Indian cows yield their milk perfectly well without this, and that early maturity can readily be induced. It seems, therefore, that on agricultural holdings it would be sounder to use cows and feed them and both the male and female calves properly, instead of maintaining buffaloes as domestic milk producers and cows to provide the essential supply of work cattle. The custom of keeping cows in cities should also be discouraged, since it is insanitary and the cows—usually the best obtainable—are generally slaughtered at the end of the current lactation.

Dual or Single Purpose Cattle.—Judging from the limited success which expert breeders have obtained in Great Britain in their endeavours to produce cattle which are really efficient dual purpose animals for the production of milk and meat, it seemed certain

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that it would be extremely difficult to produce breeds which would be efficient both for milk production and the fast trotting or walking work, which is the main purpose for which cattle are bred in India. With the rapid spread of motor transport the demand for fast trotting bullocks for road work is, moreover, rapidly decreasing, and with heavier ploughs it seems probable that slower moving cattle may in future be more acceptable to cultivators. A strong view is, however, held among them, from north to south of India, that capacity for fast work and high milk production do not go together. In any case, in view of the very striking improvement which has in recent years been effected in the milk yield, early maturity, and docility of pure Indian dairy cattle, it seems certain that the best of these breeds will be developed to still higher levels. Milk recording and the publication of milk records has been undertaken by the Animal Husbandry Bureau to this end.

The Annual Droving of Dealers' Cattle.—The droving of immense numbers of dealers' cattle from north to south and east to west of India involves constant danger of spreading contagious disease of all kinds and protective inoculation of such cattle should as far as possible be enforced.

Animal Husbandry Departments.—Embracing as it does about one-third of the domesticated animals of the world, animal husbandry in India is obviously a huge undertaking, the development of which on modern lines requires much more extensive Government provision, independent of the requirements of cash crops, than has so far been made available.

It is not possible in the limited space at my disposal to discuss all the measures which were taken during my eight years as animal husbandry expert to place the various branches of animal husbandry in India on a better footing. From the first it was obvious that in view of the crippling losses from disease, malnutrition and similar causes, far more comprehensive Government expert assistance to stock owners was required. Every help was accordingly given by the Imperial Council of Agricultural Research to the reorganisation of the Mukteswar Research Institute as (1) a research station in the hills, with staff and facilities for dealing in appropriate sections with all branches of veterinary research, and (2) a plains station for the production of biological products on the very large scale which is needed, and for research which can be carried out satisfactorily in the plains.

The research staff at Mukteswar was organised in appropriate sections, each capable of dealing with a branch of veterinary research, and the sub-station at Izatnagar was provided with additional sections to deal with animal nutrition, poultry and poultry diseases, and genetics; in addition to the production of biological products. In this way a very comprehensive animal husbandry research and production institute was built up and to provide the necessary link between research and the field of provincial veterinary departments, a veterinary investigation officer was provided for each British Province and certain affiliated Indian States. These have been of great value both to research and in the systematic study of local disease problems, and have now been made a permanent part of provincial and State disease control organisations. Stockmen, capable of carrying out inoculation and first-aid treatment, after suitable training at veterinary hospitals, were also arranged for. The facilities for disease control and animal husbandry were thus improved and research facilitated, both at Mukteswar and at veterinary colleges, and during the past decade our knowledge of disease conditions and the incidence of diseases has been greatly increased.

The standard of veterinary education and technical training was improved at most veterinary colleges, and arrangements have recently been made to institute a B.Sc. University degree course at the Madras Veterinary College, in conjunction with the four-year veterinary graduates' course. This is a welcome move in the direction of higher veterinary education, which is much needed in India.

The nucleus of an Animal Husbandry Bureau was formed and all the information available in the records of Military dairies, dairy farms and similar institutions was extracted and published. By this means the great potentialities of pure-bred Indian cattle in regard to milk production were, for the first time, made generally known and in combination with the publication of milk records, have acted as a great stimulus to the improvement of pure Indian milch breeds.

Authoritative definitions of the breed characteristics of several of the best known breeds of Indian cattle were also taken up by the Bureau, and have since been published. A village survey was carried out in four areas in different parts of India, with a view to ascertaining precisely the amount of milk and other dairy products produced and consumed by the Indian ryot.

A co-ordinated scheme for the improvement of the sheep of various parts of India was instituted by the Imperial Council of Agricultural Research and a representative was sent to South Africa to obtain first-hand information with a view to considering the possibility of establishing an Angora goat industry, in certain parts of India where similar goats already existed. Some assistance was also given to the improvement of village goats and poultry.

The main problem of animal husbandry in India is, however, the improvement of the working bullock, and one of the most important measures taken to improve livestock was the organisation in 1938 of the first All-India cattle show at New Delhi, at which representatives of the most important breeds of pure Indian-Zebu cattle were exhibited for the first time in history. Such a central show is a logical development of the annual shows which are held in most Provinces and States, and at which local cattle are judged and prizes given. These shows are a part of the measures taken by provincial governments to secure systematic improvement of livestock and have proved of the greatest value in suitable areas. If properly followed up, the central show should serve to advertise to the world that for tropical countries, Indian Zebu cattle have no equals.

Much attention was given to the improvement of dairying in India, but this matter is not discussed here as it has already been exhaustively dealt with by Dr. Norman Wright, who was brought out to give his expert advice on the many and difficult problems which have to be faced by this industry under Indian conditions.

Attention was also given to the control of disease amongst equines and to the improvement of local breeds of horses and donkeys, but the breeding of horses is not dealt with in detail in this paper as it was in the main provided for by a military organisation, and was not under the control of the Imperial Council of Agricultural Research.

Discussion

Opening the discussion, the chairman (Sir Frank Noyce) said it was the view of the Royal Commission on Agriculture (1928), and also he believed of Sir Arthur Olver, that it would be inadvisable to endeavour to produce a true dual purpose animal but that work-type cattle with a moderate capacity for milk production might be produced.

Sir Bryce Burt agreed with the essayist on the supreme importance of proper land utilisation and emphasised that the production of fodder crops and improvement in grazing were not alternatives; they must go together. He did not think mechanical power would solve the problems of peasant agriculture.

Dr. J. T. Edwards described the research work which he had carried out on rinderpest and theileriasis. In 1922 he succeeded in fixing the virus of rinderpest in rabbits and there seemed to be progressive attenuation for cattle, but unfortunately the rabbits were wiped out by disease and all subsequent attempts to repeat the work failed. After some difficulty the laboratory cattle virus was adapted to goats in 1926. Gradual attenuation for cattle occurred but the virus still produced serious disease in hill bulls. Fortunately, however, Mr. James, a veterinary inspector in the Central Provinces, took the risk of applying the attenuated goat virus to plains cattle without the simultaneous use of serum. (This is the first time this fact has been recorded.) These cattle are less susceptible than those of the hills and the trial Mr. James carried out was successful. Immunisation of cattle thus became an economic proposition. Mr. James's results, together with corroborative work, were published in a paper under the name of his chief, the late Major Stirling. Theileriasis caused severe loss in imported bulls but little was known about the systematic classification of the causal organism. The "large" one was *Babesia bigemina*, and on investigation it was found that the "small" one was *Theileria mutans* and that it was harboured by every beast in India; this accounted for the deaths of imported animals following "serum simultaneous" inoculations. Native cattle had a basal resistance both to theileriasis and rinderpest and this was a cogent reason against the development of susceptible European strains of cattle.

The problems of India in the field of animal disease and animal husbandry were peculiar, the animal ecology being of a special kind. He therefore advised the India Office that students should be given post-graduate training at their own colleges and research stations, where they could study Indian problems, and that they should not be sent to England. In this he was supported by the late Sir Stewart Stockman, and for some years after his arrival in India endeavoured, with the help of his colleagues, to give the requisite intensive training at Mukteswar. Dr. Edwards emphasised that the whole field of animal production should be looked upon as a single problem and should be directed by veterinary surgeons who had, as well as the basic training in general biology, physiology and anatomy, a knowledge of animal breeding and feeding. Sir Arthur Olver had demonstrated that animal industry in India was probably the greatest single industrial problem in the world. It was significant that it had been tackled most effectively in the Punjab where from the first the work had been in the hands of the Veterinary Department.

Mr. R. D. Anstead described the work on animal breeding carried out at the Hosur farm in the Madras Presidency. In this district the outstanding difficulty was the feeding of cattle during the dry period. The solution of the problem was mixed farming, but it was very difficult to introduce this system on the small peasant holdings.

The late Colonel G. K. Walker said that the old cattle breeders of the Punjab were nomadic and were devoted to their cattle. Serious disease problems arose when the grazing was restricted owing to the opening up of the canal colonies but the veterinary department was doing good work. The problem of feeding animals during the dry season was acute and better methods of fodder preservation were required.

Mr. A. H. Byrt said he thought one of the greatest things Sir Arthur Olver did in India was to start the All-India Cattle Show. Of the many difficulties in India in connection with the growing of fodder the small size of the holdings was one of the chief. At the Russian Cultural Exhibition in London he had seen a series of remarkably interesting graphs showing the development of agriculture and other industries in Russia. Now that Russia had become "respectable" we could not overlook her achievements and methods when striving to solve the stockbreeding problems of India.

Mr. Larry Smith described how, under his care, the work-cows at the Hissar farm gave 5,000 to 6,000 lbs. of milk without losing their working capacity.

In replying to the discussion, Sir Arthur Olver agreed with the chairman's remarks concerning dual purpose cattle. The great stumbling block to improved Indian agriculture was the smallness of the holdings. Consolidation was already taking place in the Punjab but further co-operation was necessary and the ultimate solution of the fodder problem lay in larger farming units. He agreed with Dr. Edwards's remark on the influence of veterinary education. He felt that, owing largely to Government neglect, there was no country other than Great Britain in which livestock were so important and in which so little had been done for veterinary education. At our own veterinary colleges the facilities for adequate practical training were lacking.

Notes on Uterine Irrigation in the Cow

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Camborne

Experimental irrigation was carried out in twelve healthy, non-gravid uteri, immediately after their removal from the warm carcases. The ovaries, Fallopian tubes and broad ligaments were intact in each case.

The object of the investigation was to determine whether fluids could be forced through the Fallopian tubes. The fluid injected was a solution of methylene blue and the apparatus employed for injection was an ordinary Higginson's rubber enema syringe, with efficient valves, fitted with a Nielsen's single-way catheter. This was introduced through the os in the usual manner and held in position by grasping the cervix in the hand.

The following observations were made:—

(1) If the injection is made as soon as the tip of the catheter passes the last cervical ring, fluid passes equally into each cornu. If the cervix be held in the hand whilst the catheter is being passed, it becomes evident when the correct position has been reached. It is bad practice to introduce the catheter separately into each cornu, as it is not only unnecessary but may cause rupture.

(2) It is impossible to distend the horns of the uterus with fluid to such a degree as to cause part of it to enter the Fallopian tubes, as uterine rupture always occurs before sufficient pressure can be raised. Attempts to inflate the tubes were unsuccessful for a similar reason.

In every case in which uterine rupture occurred as a result of the injection of fluids, the degree of distension, as judged by palpation, never appeared excessive and it is doubtful whether the injury would have been suspected had not a dye been employed for the injection.

(3) The rupture occurred, in every case, on the floor of one cornu, at the point where the terminal portion commences to take an outward turn. The breach took the form of a small puncture such as might be made with the pointed extremity of a lead pencil. In no case did it appear as a slit.

(4) Apparently, fluid does not escape into the abdominal cavity but into the covering of the uterus and between the double peritoneal folds of the broad ligament. When sufficient fluid had been injected to cause rupture, the blue colour could be seen creeping over the outer surface of the uterus, beneath its covering. There was no other indication that the injury had occurred.

(5) The minimum amounts of fluid to cause rupture were six ounces in the case of a Guernsey heifer and ten ounces in a young cow which had borne two calves. Twelve ounces caused rupture in a large uterus from an aged cow which had carried many calves. Such a quantity would be unsafe in every case. The margin of safety would appear to be from three to four ounces in heifers, according to age, breed and size of the uterus, and six ounces in multiparous cows. Even these amounts may be dangerous if the uterine walls have previously been weakened by pyometra or allied conditions.

(6) It is evident that rupture must have occurred in the past in connection with uterine irrigation, with some frequency. Probably the passage of iodine solution between the peritoneal folds is not invariably fatal, but it must cause serious discomfort and lessen the chances of future breeding should recovery occur. The writer has observed, on several occasions, that uterine irrigation, using the quantities of fluid usually recommended, has resulted in pain, straining, loss of appetite and cessation of lactation extending over many days. As none of these cases had been punctured by the catheter, it seems likely that rupture had resulted from injection of excessive quantities of fluid with passage of iodine solution between the peritoneal coverings of the uterus.

Weekly Wisdom

"The vanity of man is indeed expressed in the size of those illustrious textbooks, 'Cunningham' and 'Gray'—books which seem partly devised to underline the invidious distinction that man draws between himself and the rest of the animal kingdom. These volumes should, as one writer puts it, be regarded as encyclopaedias. Valuable encyclopaedias of the human frame they are, but the undeclared suggestion that the medical student should memorise everything between the two covers of one or other of these volumes is something that has wrought havoc in his soul and has given him, with rare exceptions, a rooted distaste for the anatomy of man."—From an Editorial, "*The Teaching of Anatomy.*" *Brit. Med. J.*, 1942, March 21st, p. 390.

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ANIMAL HUSBANDRY IN INDIA

THE précis of Sir Arthur Olver's address, delivered at a recent meeting of the India and Burma Section of the Royal Society of Arts, and of the discussion which followed, together with the review on the Imperial Veterinary Research Institute, 1890-1940, cover a topic which in scope and magnitude transcends anything else of immediate veterinary interest with which we have had to deal in the columns of this journal. It is of no less compelling interest to our profession because we are now at war and it is a foremost duty of the profession to exercise all its skill and ingenuity to conserve the food of the British nation by protecting the health and increasing the productivity of livestock at home. In a sense in which it has never before had that meaning in history this is a World War, in which control of the sources of wealth and happiness of almost the whole world's inhabitants is in dispute between two groups of contestants engaged in mortal combat. Short of conquest of actual territory, any grave deterioration of the food and other resources within the territories or within reach of the contestants on either side must gravely impede final victory of that whole side. And in the peace which we hope will soon again prevail it is plain that if our avowed aim is to secure freedom from want for all peoples in the world—without which, we now recognise, there will only ensue renewal of strife—it is a stern duty imposed on all of us to press forward in every way at our command our quest for improvement in the means of sustenance. What that implies in the shape of the contribution that has been made and can yet be made to ever better purpose by veterinary science in the vast territory of India has been admirably touched upon by Sir Arthur Olver and the other speakers at the meeting of the Royal Society of Arts. Hitherto, the inhabitants of that territory have been guided to progress in this direction almost wholly by graduates from the British veterinary schools. It would, perhaps, not be immodest at this stage to lay claim that the endeavours of a few of these men—like William Moorcroft, Griffith Evans, John Henry Steel, S. H. Gaiger and J. T. Edwards—sometimes in the face of unparalleled difficulties and without regard to self-interest, to do all the good in their power for the peoples of India, have been crowned with conspicuous achievement. What next will be the destiny of India and her peoples we cannot even hazard to foretell, but in recalling what they will have cause to feel indebted to from the British connection, we venture to record the belief that the peoples of India will come to express no small measure of gratitude, as well as affection, for what they have derived from the devotion to their interests of some British veterinarians.

RED CROSS AGRICULTURE FUND REACHES THE MILLION

At the foot of the Florence Nightingale statue in Pall Mall, London, the Duke of Norfolk, President of the Red Cross Agriculture Fund, handed to Lord Iliffe a cheque for £100,000, bringing the total raised by the Agriculture Fund to £1,000,000. This sum, the result of just two years' concentrated effort to provide money for the Red Cross and Order of St. John, has been raised in England and North Wales. Scotland and Northern Ireland are also making a great effort.

After pledging that everything possible would be done to meet the ever-increasing demands on the Fund, Lord Iliffe emphasised that never in the long history of the Red Cross and Order of St. John was the need for money greater than to-day.

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Mr. E. W. Hudson, M.R.C.V.S., Kettering, is to succeed the late Mr. Trevor Spencer (his former partner) as veterinary inspector at Northants County Institute of Agriculture, Moulton.

CLINICAL COMMUNICATION

Suspected Copper Poisoning in Pigs

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Cases of copper poisoning in man or domestic stock have rarely been recorded. Lander[1] states that in common with mercury, zinc, silver, barium and chromium, copper is poisonous only in the form of its soluble salts. Hoare[2] describes irritant symptoms with colic and diarrhoea and in chronic forms of copper poisoning nervous sequelae and muscular weakness. According to Hoare, cases may arise through the grazing of stock near smelting works or feeding from copper-coated vessels. In the human subject, Sydney Smith[3] states that cases arise occasionally through the formation of copper subacetate (verdigris) on badly cleaned copper vessels. During extensive experience in Egypt, however, where dirty copper vessels were widely used for the preparation of food, acute or chronic copper poisoning was seldom encountered. Acute cases were characterised by vomiting, diarrhoea, hyperpnoea, intense thirst, perspiration and severe headache. Death was rare. Autopsy showed gastric irritation, and occasionally green staining of the mucous membrane, with softening and ulceration. Chronic cases, which were encountered mostly in copper workers, were characterised by gradual anaemia, nausea, vomiting, colic, diarrhoea, and general malaise and debility. In the later stages of such cases, peripheral neuritis and degeneration and atrophy of the muscles sometimes occurred. Drummond[4], in a series of experiments, fed rats on peas which contained 50 mgs./kilogramme of copper as a colour preservative. There were no ill effects. Public Health regulations in the United States of America permit the addition of ¾-gramme metallic copper per pound of peas for colour preservation purposes. No cases of copper poisoning have resulted even in persons using such peas extensively.

History.—The pig stock at the beginning of the outbreak about to be described comprised 1 boar, 3 sows, 8 unweaned pigs and 23 store pigs. Disease was first encountered about a month after swill-feeding had been introduced. Only the boar, 1 sow and 12 store pigs were receiving swill, the remainder of the stock being fed on meal. Disease was confined to the swill-fed pigs, and although the others were maintained in intimate contact with them, none showed any signs of illness. One sow and 10 store pigs were visibly ailing. The boar and 2 store pigs appeared healthy, but were not eating well.

Symptoms.—The ailing pigs showed pyrexia (104° F.), anorexia, either constipation or diarrhoea and a tendency to hemiplegia.

Autopsies of two store pigs slaughtered for diagnostic purposes showed only subacute gastro-enteritis with petechiation of the bowel serosa. Swill-feeding was at that stage discontinued.

The disease subsequently revealed itself in a well-defined course, an initial phase, a climax, and a period of recovery. These phases were characterised thus: initial pyrexia (103-105° F.), anorexia, hemiplegia and marked constipation; at the climax, great weakness, paraplegia, dark foetid diarrhoea and V-shaped cyanotic discoloration of the skin extending from the base of the neck to the middle of the back, but not elsewhere; recovery heralded by renewal of appetite, and disappearance of cyanosis, full recovery being denoted by marked exfoliation of the epidermis on the V-shaped cyanotic patch. Similar exfoliation appeared on the testicles of the boar which was ill for only a few days. About the climax of the illness, symptoms of peripheral neuritis became apparent in several animals. In a few cases the initial signs of epileptiform convulsions were exhibited, but the convulsive stage was only attained by one animal. Cessation of swill-feeding brought about recovery in every case within a few days. In some pigs such recoveries were of a spectacular nature. Thus, the sow which at first examination appeared almost moribund and was quite unable to rise, was rooting and eating well within a week.

Aetiology.—Attention was directed to the dietetic origin of the disease by the fact that other pigs on the same premises fed on meal remained healthy. Examination (non-chemical) of the swill failed to reveal any undesirable properties, but it transpired that the material after collection was allowed to remain in a copper boiler for a number of days. This boiler was exposed to the weather and was heavily encrusted with verdigris (copper subacetate), formed presumably as the result of acid fermentation. Boiling of the swill took place each week and subsequent feeding was direct from the copper. No attempt was made to clean the utensil between operations. Later feeding with the same swill which had not been prepared in the copper was not attended by untoward results.

REVIEWS

Government of India Imperial Veterinary Research Institute, 1890-1940*

It is difficult for workers in Great Britain to realise the size and character of the Mukteswar "Research Institute." It carries out the research work and produces biological products for a subcontinent, containing over 100 million farm livestock, in which the great epizootic diseases still exist. It is an isolated mountain community 16 miles from the nearest road, with its own farm, school, hospital, post office and recreational facilities. Very large numbers of bulls, goats and sheep are used for experimental and routine work each year and when the investigations on rinderpest were at their height 2,000 bulls were used in one year. The director is now classified as the head of a Government department.

The Government of India, in 1888, deputed two men to study Pasteur's method of anthrax immunisation; in the same year a survey of cattle diseases was begun in order that the prevalence of various kinds of disease could be ascertained and an attempt made "to discover the peculiar character of the disease germ and the vaccine required to combat it." The appointment of a permanent microscopist was also recommended. [The progressive nature of the Indian Government will be realised when it is remembered that the work of Pasteur and Lister was still fresh and up to 1880, at least, their views were being vigorously opposed in Great Britain.]

In 1890 Dr. Lingard was appointed as Imperial Bacteriologist at Poona and began investigations on surra. The Imperial Bacteriological Laboratory was moved from Poona to Mukteswar in 1893 and after Koch's visit in 1897 the production of rinderpest serum was begun. The Izatnagar sub-station was added in 1913 and has been steadily enlarged. In 1939 new sections for Animal Nutrition and Poultry Research were added and proposals are before the Government of India for the addition of an Animal Genetics section. When this has been completed the two research institutes will satisfy the modern scientific view that the investigation of all subjects connected with the development of livestock and poultry should proceed side by side. Even economic problems concerned with the marketing of livestock products are being investigated.

The huge development of the Imperial Veterinary Research Institute from the very small beginnings in 1890 has taken place chiefly under the direction of Dr. Lingard, 1890-1907; Col. J. D. E. Holmes, 1907-15; Dr. A. L. Sheather, 1916-20; Dr. J. T. Edwards, 1921-29; Mr. F. Ware, 1929-38, and Dr. F. C. Minett is the present director. From time to time there have been officiating directors. As now organised there are three main divisions at Mukteswar: the Sections of General Disease Investigation, Pathology and Bacteriology and Veterinary Zoology respectively. There are also Engineering and Estate Management departments.

The Institute's achievements in the domain of pure and applied science have been of very wide significance. Dr. Lingard was able to show the specific affinity of arsenic for the parasite of surra, a discovery of far-reaching importance. Even more advantageous from the point of view of livestock owners has undoubtedly been the great advance made in the control of rinderpest, consequent upon Dr. Edwards's introduction of the goat virus vaccine. Haddow says that the general adoption of this method of immunisation has been attended with phenomenal success and may rightly be considered as one of the invaluable achievements of the institute. At the same time that the research work which led to the development of the goat virus vaccine was being carried out—as the result of a recommendation by the Inchcape committee, since rescinded—the institute had to be made self-supporting and then, for the first time, a large profit was made by the sale of biological products. [Pfaff (1938) said that 1,000 doses of virus can be produced at a cost of 4s. and that immunity is produced within 48 hours and is probably lifelong. Goat virus alone has now been successfully used even during outbreaks of disease and to immu-

SUMMARY

An outbreak of a condition in pigs, with circumstantial evidence of copper poisoning, is described. Symptoms included pyrexia, anorexia, constipation or diarrhoea, hemiplegia, V-shaped cyanotic discoloration of the skin of the back, peripheral neuritis and exfoliation of the epidermis. Rapid recovery occurred in all cases when contamination of the food was eliminated. No natural deaths occurred.

References

(1) LANDER. Veterinary Toxicology.
(2) HOARE. Veterinary Therapeutics and Materia Medica.
(3) SYDNEY SMITH. Forensic Medicine. 2nd Edition, 1931.
(4) DRUMMOND. *Analyst.* October, 1925.

nise sheep. Although there are at least three types of inactivated tissue vaccine, the use of goat virus is spreading to other parts of the world.]

Notable advances have also been made in the control of haemorrhagic septicaemia, anthrax, blackquarter and surra. Now that some measure of control has been achieved over the chief epizootic diseases it has become possible to study the problems of nutrition, deficiency diseases and animal breeding. The Izatnagar substation is being specially developed to study these problems which are of outstanding importance. There are still many disease problems, however, and the more insidious diseases with which we are familiar in Great Britain are now attracting attention in India. Research work is also being carried out on numerous other conditions such as equine encephalomyelitis and the apparently allied disease "kumri"; the clinical and pathological aspects of lathyrism; diseases of new-born animals; pneumonia in cattle of unknown aetiology which is responsible for large numbers of deaths, and the numerous protozoal and parasitic diseases which are of such great importance in tropical countries. There is a special section of veterinary zoology which studies the biological problems of disease causation and control, and particularly the part played by the enormous and varied parasitic fauna of Indian domestic stock.

It would appear that a concerted and well-directed effort is now being made to solve the numerous inter-related problems of livestock production and the marketing of livestock products in India. The importance of animals in maintaining soil fertility is becoming more and more evident and we can conclude that the future of Indian agriculture—the future of India—will depend to no small extent on the combined investigations carried out into the problems of disease control and the *positive* production of animal health at Mukteswar and Izatnagar.

* Golden Jubilee. Issued by the Imperial Council of Agricultural Research, India. Supplement to *Indian Farming*, Vol. 1, No. 11.

For a further account of the work being carried out at Mukteswar and Izatnagar, together with photographs of the buildings, see "Veterinary Research and the Indian Agriculturalist." Government of India Press, Calcutta, 1941, and summary of annual report, 1940-41, p. 303 of this issue.

* * * * *

[RECONSTRUCTION AND THE LAND. AN APPROACH TO FARMING IN THE NATIONAL INTEREST. By Sir A. Daniel Hall, K.C.B., M.A., LL.D., D.Sc., F.R.S. (1941.) London: Macmillan & Co., Ltd. Price 12s. 6d.]

Having spent a whole busy lifetime in promoting agricultural research and education in this country and occupied posts of high distinction in these pursuits—as recorded in the memoir published in this issue—Sir Daniel Hall, whose death on July 5th last we have already announced, by good fortune has bequeathed what may be called a "survey scheme" embodying a carefully-thought-out long-term plan for the development of British agriculture. The preface to his last book is dated May, 1941, and events have been moving quickly since then. The book is of more than passing interest to the veterinary profession for at least two reasons. First, at this moment more than ever before, in view of the particular services which now and in the immediate future we claim to fall to the veterinary profession, any wisely formed policy for the organisation of the profession must needs take into account all possible trends in agricultural development. Secondly, while no one dare foretell the exact lines of development, what with the present rapid progress of scientific achievement and the convulsions of war, no scheme can be deemed worthy of serious consideration unless it is based on a careful study of all the evidence that can be accumulated and upon which a just appreciation of the present situation and what is lacking in it for vigorous development can be formed. For these reasons, a survey such as that undertaken personally by Sir Daniel Hall may well serve as a model. It need not necessarily be accepted, for we realise that his prognostications have turned out sometimes to be wide of the mark and his arguments have not always found favour with those imbued with the traditional outlook upon British farming.

Although in the past the strength of the British position has been its reliance on its own well-tried methods and opposition to changes until they have been subjected to careful trial, the present world situation, if nothing else, tells plainly that the chances for survival depend upon our capacity to adapt ourselves rapidly to the new circumstances in which the greatest use is made of all resources at our command. "Since the last war," Hall says, "discussions of and experiments in agricultural policy have been continuous, and by their lack of success have demonstrated that nothing less than a fundamental reconstruction can enable British farming to survive as an independent industry paying its way in the national economy." The purpose of the book is, therefore, "to show that the assistance which for some years now the Government has been according to farmers is not tending towards the development of agriculture. Farmers have been given much that their representatives have asked for, but what the farmers want is not necessarily what either farming or the national interest needs. If farmers are in a bad way it is more important to remove the causes of the decline than to pay the farmers' losses and enable them to carry on as they have been doing." . . . "For all its apparent stability British agriculture has been changing from age to age."

After looking into the history of farming and sifting the data, admittedly in many respects still meagre, Hall comes to conclusions based on arguments which are fully reproduced below and formulates his own scheme. The scheme, Hall maintains, is but an orderly progression along the line British farming has been following throughout all its history. In summary, his argument is that farming has been declining in Great Britain for the last seventy years, and the rate of decline has been accelerated during the last twenty years. The decline is seen in diminished gross production from the soil, though values have been to a considerable extent maintained by the increased attention given to livestock products in part derived from imported feeding-stuffs, and to intensive crops like vegetables and fruit. But the area under cultivation, at the date of his writing, and the number of men employed upon the land, had shrunk and was shrinking. The condition of the agricultural land is declining; its equipment has not been kept up nor renewed to meet modern conditions of work. The landlords as a class are unwilling, and often unable, to spend more capital upon land let for farming. When reconditioning has become essential, as in drainage works and the provision of lime and phosphate for the land, the State has had to step in with grants-in-aid.

It is accepted that the industry of farming, taken as a whole, is unprosperous. It has been found necessary to assist it by a system of subsidies and duties on imports which in the aggregate amount to a considerable burden upon the taxpayer. These bounties are unconditional, in that they involve no reciprocal duties from the recipient farmers and are not designed to produce any plan of reconstruction in the industry. The depression in farming has been brought about by the comparatively low prices ruling for agricultural products due to cheapened methods in overseas countries and to some extent at home. The factors that have caused the destructive low prices in the British market have been various, *e.g.*, the adoption by some of our competitors of modern mechanical and scientific methods for greater production; the availability, to other competitors, of cheap land and labour, and in some cases Government assistance to secure access to the largest open agricultural market.

Though farming in general is unprosperous, there is ample evidence that a large proportion of farmers have been making a good return from their capital and labour, even in the disturbed years since 1929. A detailed examination of farmers and their accounts does not indicate that they are specially deficient in skill or that their results would be markedly improved by better technical knowledge. The survey reveals that the farming community is in the main composed of small units which neither occupy enough land nor employ enough labour to support the farmer. The uneconomic character of the small farm is mainly due to its inability to support large-scale mechanical working and to make use of other scientific discoveries.

The conclusion is reached that the ill-success of farming is due less to the farmers than to the conditions under which farming has to be practised. The farming structure has grown out of date and requires reconstruction to meet the needs of the new farming with its enlarged powers and resources.' For this reconstruction of the fabric of farming and reconditioning of the land the current landlords are not prepared. They have not that belief in the future of farming and the owner's control of the land to venture on the expenditure. Moreover, combined action is necessary; though the single landlord can do much to ameliorate the condition of his estate, many of the improvements of the greatest moment would affect more than one estate.

The State is the only agency that can carry out this necessary adaptation of the land to the new conditions. To do so and to get repaid for its expenditure the State must become owner of the land. The State will purchase the whole of the agricultural land of the country, defined as that lying outside the jurisdiction of the city, borough, or urban district authorities, at a price based upon the annual valuation for Income Tax under Schedule A, the payment being made in a long-dated Government Stock. The land will be admini tered in the first instance by the Commissioners of Crown Lands, on their present methods through approved firms of land agents.

In order to carry out the allocation of land into larger and more economic units, with such works of drainage and reclamation as may be required, a Corporation shall be instituted and furnished with capital by the Government. The members of the Corp ration shall be nominated by the Government; it shall be an executive body possessed of autonomy in its conduct of business and finance, though responsible to Treasury audit and control. The Corporation, having leased certain areas of land from the Commissioners of Crown Lands, will divide it into economic units and carry out such works of drainage, reclamation, building and reconditioning as may be necessary to fit the land for farming under modern conditions. It will, as a rule, return the land to the Commissioners to be let to tenants in the usual way, but the Corporation may retain certain farms as training-grounds for managers or

for experimental purposes. The Corporation will continue to act as Technical Advisers to the Commissioners of Crown Lands as to the improvements that may be effected in the farming of the land under the Commissioners' Control.

In order that the increased powers of production thus brought into play shall be developed for the benefit of the general population of the country, the Minister of Agriculture, with such other Ministers of Food and Supply as may be concerned, will confer and draw up a plan indicating, for the products of the farm, the relations to be aimed at between home production and imports, and the improvements in distribution that should be carried out. In order to interpret this plan and to advise Ministers as to its working or modification, a small Council shall be appointed, consisting of independent men of affairs, one of whom shall be in the House of Lords and a second in the House of Commons. The Council shall continue its existence through changes of Ministers and Governments, and shall act as the guardian of the policy that has been approved by the Government until some new policy may be adopted and entrusted to it. In order to carry out the plan, a Supply Board shall be set up for each of the major products of the farm, whose members again shall be nominated men of affairs, not connected with the subject governed by that Supply Board. The business of the Supply Board will be to control the trade in the commodity entrusted to it, and to make provision for its production at home and its purchase from overseas in the proportions designated in the plan. To this end the Supply Board will in general make use of the Marketing Board Organisation.

REPORT

[IMPERIAL VETERINARY RESEARCH INSTITUTE, MUKTESWAR AND IZATNAGAR. Report for the year 1940-41. (Minett, F. C.) (High Commissioner for India, Aldwych, W.C.2). Price 2s. 9d.]

This is the second report since Dr. F. C. Minett became Director and is on simlar lines to that of 1939-40.

General Section.—The 35 members of the senior staff are specified, Mr. Haddow has been appointed deputy director; the total number of subordinate staff is 1,120.

An outstanding event of the year was the meeting at Izatnagar of the Animal Husbandry Wing, held under the auspices of the Imperial Council of Agricultural Research. The Director has continued his visits to research centres in the Provinces and States in order to co-ordinate research work as far as possible. The Officer-in-Charge Poultry Research Section was appointed Honorary Secretary of the Indian Poultry Club and Editor of the *Indian Poultry Gazette.*

Special Sections

General Disease Investigation (Shirlaw, J. F.).—Apart from heavy routine work a special study has been made of contagious bovine pleuropneumonia and it has been shown that strains isolated in India are similar to those from other parts of the world. The same aetiological types of mastitis occur as in western countries, and it also appears that sterility in cattle is as rife in India as elsewhere. Sterility in mares and stallions is also being specially studied. What appears to be a neurotropic virus has been isolated from cases of bovine encephalomyelitis and passaged in rabbits and guinea-pigs. The major epizootic, pneumonia of goats, is probably due to a virus and successful immunisation has been carried out in the field simply by inserting a small fragment of diseased lung tissue under the skin of the ear.

Pathology and Bacteriology (Haddow, J. R.).—An alumina-adsorbed vaccine has given promising results in immunisation experiments against Ranikhet disease (Newcastle disease). It is stated, however, that the value of this method will have to be compared with another which has also been evolved (presumably that reported by Iyer and Dobson. *Vet. Rec.* **52**. 891-894).

A new and highly fatal virus disease of goats somewhat resembling, but immunologically distinct from, goat-pox has been studied. Nodular-necrotic lesions develop in the skin and frequently also in the intestinal and respiratory tracts. The udder may also be affected. Field surveys to determine the incidence of contagious abortion are being carried out.

Veterinary Zoology (Datta, S. C. A.).—G. K. Mehra has shown that pasteurella infection can be transmitted from rabbit to rabbit by the dog flea *Ctenocephalus felis.* Warble flies cause great damage to the hides of cattle and the relative larvicidal values of tobacco-lime infusion and derris soap wash, against *H. lineatum* have been compared. Derris appeared to be slightly more effective, but cost about eight times as much. This section is co-operating in the control of malaria amongst the institute staff. The evidence that chronic bovine haematuria is due to a fungus, probably an *Aspergillus mycoma,* is rapidly increasing. Morbid materials in glycerine and in formalin from other countries for comparative study would be gratefully received.

Animal Nutrition (Sen, K. C.).—Work has chiefly been devoted to studies of carotene and vitamin A, as this is a common vitamin deficiency of Indian livestock. The value of various famine fodders, and the effect of vitamin A, vitamin C and calcium on tuberculosis infection in guinea-pigs have also been studied.

Poultry Research (MacDonald, A. J.).—In addition to work on poultry nutrition the value of eggs in supplementing the normal village diet was studied. Experiments on breeding, and the hatching and storing of eggs were also carried out.

Biological Products (Hassan, S. R.).—Production continued on a large scale. The general condition of the dairy herd was good, but a virulent outbreak of foot-and-mouth disease killed 17 calves.

General.—The veterinary, medical, engineering and estate sections carried on their essential work.

J. F.

MEMOIR

Sir A. Daniel Hall, K.C.B., M.A., LL.D., D.Sc., F.R.S.

The death of Sir Daniel Hall, on July 5th last, marks the passing of one of the chief architects of the present structure of veterinary research.

Born of a Rochdale family and educated at Manchester Grammar School and Balliol College, Oxford, where he took a first-class in chemistry in 1884, he was shortly afterwards a lecturer under the University Extension Movement, travelling mostly in Kent and Surrey, and became more and more interested in agricultural education. With influential private support he secured the old Latin College at Wye, in Kent, in 1894, and Wye Agricultural College was thus started. Gathering around him keen young scientific workers, Wye had a brilliant career under him, and its influence spread all over the country. In 1902 he became Director of the Rothamsted Experimental Station, then at a critical stage of its history. The famous founders of the Station, Lawes and Gilbert, were both dead, no Government support was forthcoming for research, and the funds available under the Lawes Trust were insufficient to extend research. Again with help from unofficial sources, Hall was able to attract young people, working as teams, to commence work on modern lines, and the classical field experiments of Lawes and Gilbert were saved from lapsing. Rothamsted again became one of the most renowned agricultural research stations in the world.

Soon after it came into power, in 1905, one of the strongest Governments of modern times—as we can now appreciate, on looking back at the array of enterprising and enlightened talent it contained—set about, in the teeth of opposition which is now hardly understandable, to promote the welfare of the people by raising the necessary public funds and allocating them in a manner conforming with British traditions for public vigilance in their proper expenditure. Only last week the thirtieth anniversary of the National Health Insurance Act took place, which brought about the formation of the Medical Research Committee (later Council) to allocate and supervise the use of the funds placed at its disposal for medical research. Under the vigorous lead of the President of the Board of Agriculture and Fisheries of the time, Mr. Walter (now Lord) Runciman, ways and means of helping farmers were explored. In particular, concerted schemes were thought out to find out how best the farmers could secure the benefits to be derived by promoting scientific research. Governments in this country had lagged lamentably far behind those of some other countries in the measure of help they had given in this respect. Public support to undertake scientific investigation into the varied subjects that fell within the purview of agricultural research had been in earnest demand from distinguished men, qualified to speak with knowledge and authority, who were working at the universities, colleges and other institutions, in conditions of parsimony, like, notably, A. D. Hall, of Rothamsted, workers at the Cambridge School, such as Bateson, Biffen, Marshall, Punnett and Wood, and, in must be said in veterinary research, at that time, almost alone, M'Fadyean, of the Royal Veterinary College, London.

The Board (now Ministry) was fortunate in having as Assistant Secretary in charge of Research and Education a man with a wise and wide outlook on the problem gained from prior pioneer work in research and teaching in this country outside official circles, and experience both at home and abroad, in India, namely Mr. T. H. (now Sir Thomas) Middleton, the present Chairman of the Development Commission. The Chief Veterinary Officer of the time, the late Sir Stewart Stockman, thus received staunch support in putting into shape aims also conditioned by early experience outside officialdom, as a teacher of his subject, in research and in the management of large-scale problems as they occur overseas. Funds hitherto could not be diverted to research as apart from education, and so an expedient entirely novel in British administration was devised. The Development and Roads Improvement Act, 1909, was passed after close discussion in Parliament, as an adjunct to Mr. Lloyd George's "People's Budget" of 1909, and

under it the Development Fund established. A Commission, comprising five but soon afterwards eight members, was appointed in May, 1910, to recommend to the Treasury the apportionment of the Fund. It had no executive functions, for the monies of the Fund were to be recommended to institutions already in existence over which the Commissioners had no direct control. The late Sir Daniel Hall was an original member and was undoubtedly the only member qualified to express judgment on matters directly concerning research. A prominent original member was Mr. Sidney Webb (now Lord Pasfield), the economist. In October, 1912, Hall, to his regret, retired from his post as Director at Rothamsted and became a paid member of the Commission, giving his whole time to the work (with the other, administrative, paid member (Vaughan Nash). In this capacity he devoted his energies to working out the scheme which is recorded in the 1912 report of the Commissioners.

In some essential respects the machinery for the execution of research was not in being, and what was still more important, the trained personnel to undertake research was not available, and had to be assisted to its feet by means of studentships. Furthermore, the means had to be devised to transmit the knowledge gained at the research institutes to farmers and reciprocally to bring to the notice of the institutes the problems that actually confronted the farmer. So that we get the sequence of these early phases in correct sequence, the words of the second (1912) report of the Development Commission may be quoted:—

"In their previous report the Commissioners explained that at the end of March 1911, they were considering a general application from the Board of Agriculture and Fisheries for the organisation of a system to aid and develop agriculture by the provision of technical advice for farmers, and by promoting scientific research and experiments in the science, methods, and practice of agriculture. . . .

"Meanwhile the Commissioners were discussing with the Board the general scheme which the latter had originally prepared in 1910, and had set forth in detail at the end of January, 1911. Outstanding differences of opinion were finally settled by a conference at the beginning of June between Mr. T. H. Middleton, representing the Board of Agriculture, and Mr. A. D. Hall, representing the Commissioners. Their recommendations were accepted by the Board and the Commissioners, and on August 10th the latter were able to submit for Treasury approval the scheme set out in extract from their report of that date which is printed in Appendix D."

The above report may be regarded, to our mind, as the "Magna Charta" *of veterinary research*, and so we offer no apologies for the space occupied in adverting to its origin, on the occasion of the death of, as we have already denominated him, one of its chief architects.

"The Commissioners and the Board," the Report states, "have now arrived at a general agreement on a scheme for promoting research in agriculture, and for the provision of technical advice to farmers, in so far as the scheme for farm institutes already approved does not cover the ground. When the scheme is in full operation its general character and cost will be as follows:—

"(1) Technical and Advisory Work.

"The Commissioners will be prepared to recommend an annual advance by way of grant to the Board of Agriculture and Fisheries of a sum not exceeding £12,000 to be apportioned by it among 12 colleges, which will form the centres of as many areas, so arranged as to cover the whole country. . . .

"(2) The Institution of Scholarships . . . .

"(3) Research Institutes

"The Commissioners will be prepared to recommend that a sum not exceeding £30,000 per annum be advanced by way of grant to the Board . . .

[The Institutes include]:—

"(*b*) Animal Pathology. The Royal Veterinary College and the Board's Veterinary Laboratory. . . .

"(4) For particular investigations not specially provided for. . . .

"(5) For administration."

In the fourth (1914) report of the Commissioners there occurs this passage, which was at the time unprecedented in the annals of British veterinary science, starved of State support and neglected as it had been since its inception in 1791:—

"There is one important subject connected with livestock improvement to which they [the Development Commissioners] have decided to devote special and considerable sums of money, viz., research in Veterinary Science. They mentioned in their last report that although considerable provision for the purpose (to the extent of £4,000 a year) was made in the General Research Scheme, applications had been received for further grants from several parts of the United Kingdom. To examine these applications they appointed a small committee, who conferred not only with representatives of the applicants, but with other distinguished men of science, such as Sir John Rose Bradford and Professor Nuttall. On the report of this committee, they agreed to capital grants of £28,650 to the Board of Agriculture and Fisheries and £8,000 to the Irish Department of Agriculture and Technical Instruction for new laboratories to replace the existing inadequate accommodation; to annual grants for the maintenance of the research work carried on at those laboratories when completed; and to devote £2,000 a year to assist special pieces of research work carried on at the various veterinary colleges and institutions of the United Kingdom. They are disposed to think, however, that this scheme would be incomplete without provision for what may be called a permanent headquarters of veterinary research (other than laboratories under official control and devoted mainly to meeting administrative requirements); and accordingly they contemplate a grant to endow a Professorship of Comparative Pathology at a university, and to furnish the Professor with proper laboratories and a staff of assistants. But questions of detail connected with this part of the scheme are complicated and cannot yet be settled."

The outbreak of war, in August, 1914, upset the Commissioners' calculations, and the Advisory Committee which they had intended to set up at once to enquire into research upon diseases of animals was not appointed until after the war, namely in 1921. In the Committee's report (1922), it is recorded that:—

"Had the plan contemplated by the Commissioners in 1913 not been thwarted by the outbreak of war the position of veterinary research in the United Kingdom and its support from private funds might have been very different."

So would probably have been the careers of the young men who had before the war begun their training in veterinary research under the above scheme.

In the passages quoted above we can trace readily the beginnings of things which provided, very soon, the Ministry of Agriculture's Veterinary Laboratory at New Haw (opened in 1917), the organisation within which the present veterinary advisory and investigation officers came to be employed, and, after some suspense, the other veterinary research institutions, at the Royal Veterinary College, London, Cambridge and Moredun. It would have been doubtless Hall's wish to have had the London College rebuilt at Cambridge, but the Martin Committee (1929) decided on the retention of the London site.

During the 1914-18 war, Hall left the Commission and became, in 1917, under Lloyd George's Government, Permanent Secretary to the Board (now the Ministry) of Agriculture and Fisheries—a unique departure in that it placed a scientist at the head of a Government department concerned with a phase of national economy in which he was pre-eminent, and one characteristic of the methods adopted by the then Prime Minister in winning a war—remaining in that office till 1920, when the post of Chief Scientific Adviser was created for him, until it was terminated in 1927. At the Ministry Hall in his official capacity continued to wield great influence over veterinary activities and worked in close harmony with the late Sir Stewart Stockman, then Chief Veterinary Officer, ranking in status as an Assistant Secretary. At the first annual meeting of the N.V.M.A. after the late war, namely on October 31st, 1919, Hall was a guest of the evening at the annual dinner and the following passages from his speech on that occasion merit reproduction:—

"The veterinary profession of the future has got to be founded upon an amount of study, an extent of professional study and a great background of research such as it has never been called upon in the past. In the course of the speeches this evening allusion has been made to the fact that the veterinary profession has supported itself in the past. If we are to have this field of research, this extension of education behind the profession, it is, I think, clear to everybody that if the profession is to be worthy of its position it can never be self-supporting in the same way in the future; and that the State must come forward, not only in the interests of the veterinary profession, but in the interests of all human beings to forward this, and give opportunities for the development of this field of research. . . . My Board perhaps sees these things from the broad statistical point of view . . . that diseases occur, that there is enormous mortality amongst domestic animals which surely should be preventable. . . . There will, of course, always be a large amount of individual practice in the case of animals like horses. There the values run into large figures; but the real big losses to the country, to the agricultural community, occur in connection with animals like sheep, where the farmer accepts ruefully but still accepts loss up to a certain percentage as an ordinary occurrence—as an inevitable accompaniment of the fact that he is keeping sheep. On that class of disease the nature of the treatment that is most applicable and the investigations that must take place will never be carried out at the expense of the individual farmer; it will in some way or other tend to become a matter of State or generalised treatment on lines of the Medical Officer of Health. . . . I do feel that in the immediate future your profession is going to be in a kind of transition stage, that there will be considerable passing-over from the stage of the private practitioner, called to treat cases of sickness, to the position of the Medical Officer of Health who is called upon to prevent that sickness taking place at all; and what we have to do is to try and see that this transition takes place on a basis of knowledge—that is, a basis of research in which I am so primarily interested, and also without injury being inflicted upon the individual in the process. That is a matter with which an Association like this, dealing with the ethics of the profession, is most particularly concerned. I am sure that that transition, if it be a transition that is in the real interests of the public, is one that will also be made without damage to individuals, and that it is one that will take place to the real interest of the veterinary profession itself."*

Hall was Chairman of the Agricultural Advisory Committee to the Development Commission from its inception in 1923 until it was abolished, following the recommendations (September, 1929) of the Warren Fisher Committee "to consider the future arrangements for financing agricultural research," and the present Agricultural Research Council formally constituted, in 1931, responsible to a committee of the Privy Council, but maintaining close relationship with the Development Commission and occupying the same offices. Hall was an original member of the new Council and Chairman of its Plants Committee. His direct interest in veterinary affairs had, however, waned.

After leaving his official position at the Ministry, Hall followed Bateson as Director of the John Innes Horticultural Institution, and was there able to indulge in one of the chief diversions of his crowded life, namely in scientific plant breeding and floriculture. His numerous books had a very wide appeal and the last one on "Reconstruction and the Land" is being given, in this issue of our journal, an extended review, in no small measure as homage to his memory.

J. T. E.

* By a coincidence, a passage from the above speech formed the "Weekly Wisdom" selection for the issue of *The Veterinary Record* published on the day before Sir Daniel Hall's death.

ROYAL COLLEGE OF VETERINARY SURGEONS

Membership Examination (July, 1942)

LIST OF SUCCESSFUL CANDIDATES

(*Continued from page* 294.)

Glasgow

FIRST YEAR:

Campbell, R. S. F. (B)
*Dickie, A. T.
Forteath, A. D. (C)
Lawson, D. D.
McGown, Sydney
McNicol, O. D.
Simpson, Bert
Torley, J. A. (C)
Young, A. A.
*Young, G. B.

* Denotes 2nd class honours.
(C) Denotes credit in Chemistry.
(B) Denotes credit in Biology.

SECOND YEAR:

Aird, J. S.
Brown, John
Burns, John
Campbell, Donald
Dunn, A. M.
Galbraith, Miss M.
Hyam, Richard
Lapraik, R. D.
McGregor, J. L.
McKenzie, Alexander (H)
Mackenzie, Miss C. (H)
Mackenzie, Miss J.
Sullivan, Jerome
Thomson, Wm.
Watters, C.
Wilson, Andrew
Wilson, Miss J. (P)

(P) Denotes credit in Physiology, etc.
(H) Denotes credit in Histology, etc.

THIRD YEAR:

Denholm, I. C. (A)
Donald, Miss Nancy
Gregor, Alec
Hamilton, Andrew
Hartman-Smith, C. A. (H) (P)
Hastie, P. S. (A)
Johnston, J. B. (A)
Kerr, J. D.
McGuinness, Alex
Maguire, R. D.
Maneely, R. B.
Markson, L. M.
Morton, Alex
Parker, Joseph (A) (H)
Pinkney, Miss Jean
Usher, F. J.

(A) Denotes credit in Anatomy.
(H) Denotes credit in Hygiene.
(P) Denotes credit in Pharmacology.

FOURTH YEAR:

Baxter, J. D.
Boyd, J. A.
Brown, A. C. L.
Brownlee, W. A. D.
Bryson, R. W.
Callum, R. H. B.
Cooper, Miss M. B.
Craig, John
Duncan, T. H.
Logan, J. B.
Gilmour, J. M.
McLelland, R. M. M.
Neil, H. J. D.
Pfob, L. S.
Stewart, E. A.
Stewart, Wm.
Wilson, R. M.

FINAL YEAR:

Bayliss, J. B.
Bradley, J. F.
Bryson, I. C.
Crerar, William
Grant, P. N. H.
Holt, A. F.
Johnston, Adam
Lauder, I. M.
Loughridge, Samuel
McCance, C. M.
McElhone, J. S.
McIntyre, Donald
Mackay, J. R.
Miller, Andrew
Moir, R. S.
Nimmo, J. K.
Noble, W. A.
Paterson, R. A.
Quigley, P. J.
Samuel, Miss Mona
Scott, K. E.
Skillen, W. W.
Steele, R. L.
Taylor, G. B.
Taylor, J. M.
Thain, R. I.
Watson, Miller
Wilson, W. R.

Edinburgh

FIRST YEAR:

Bryson, Wm.
Butler, M. C. (B)
Cameron, John
Clarke, A. V. (C)
Gledhill, G. G. (B)
Gourley, James
Hezlett, R. K. (C)
*Lambert, P. S.
*Leach, J. L. R.
McLean, M. W.
Marshall, P. M.
Mather, D. B.
Scott, G. R. (C)
Slee, Alan
Towse, G. H. H. (C)
*Wilkinson, Leonard
*Wilson, J. B.

(B) Denotes credit in Biology.
(C) Denotes credit in Chemistry.
* Denotes 2nd class honours.

SECOND YEAR:

Arnot, C. A. M. (P)
Archer, Dennis (P)
Baillie, J. R. (P)
Banks, P. J.
Beynon, R. S. (P)
Black, T. S. M.
*Blamire, R. V.
Bridge, P. S. (P)
*Duncan, George
*Fairclough, R. R.
*Grant, D. L.
Gray, G. M.
Hanscomb, Raymond
Harding, H. P. (P)
Hetherton, Colin
Hill, R. L.
Landridge, R. N. T. (H)
McCartney, W. D. J.
Newlands, T. B.
Osborne, A. D. (P)
Preston, P. T. (P)
Sharman, G. A. M.
Singleton, W. B.
*Steven, H. J.
Temiyachol, P.
Wallace, R. J. L.
Wildbore, J. G. S. (P)

(P) Denotes credit in Physiology, etc.
(H) Denotes credit in Histology, etc.
* Denotes 2nd class honours.

THIRD YEAR:

Brown, David
Chambers, T. A. M.
Clarke, A. J.
Cowie, R. S.
Davie, John
*Duncan, L. J. P.
Edgar, James (A)
Fennell, Clement
Ferguson, G. S. (A)
Geary, F. C. (A)
Gibson, G. M. (A) (H)
Gunstone, J. W.
Jobling, Richard (H)
Latimer, G. E. (A)
Letham, J.
MacKellar, J. C. (A)
Maclenna, K. J. R. (A)
Moody, F. C. (A) (H)
Murray, M. D.
Nisbet, D. I.
Porteous, A. J.
Pottinger, F. H.
Rees, L. F.
Salisbury, Norman (A)
Scott, H. M.
Smith, S. R. H.
Snodgrass, Nigel
Stephenson, F. D.
Stewart, James
Stirling, John
*Thomas, P. D. I.
Vickers, T. A. (A)
Walker, J. A. G.
Wilson, Alexander
Zlotnik, I.

(A) Denotes credit in Anatomy.
(H) Denotes credit in Hygiene.
* Denotes 2nd class honours.

FOURTH YEAR:

Allen, T. H.
Beattie, I. S.
Bell, R. L.
Bruce, W. (Paras)
Cameron, J. A.
*Coombs, R. R. A.
Dawson, F. L. M.
Donald, D. E. (Paras)
Ellse, J. B.
Garside, J. B.
Geary, J.
Girvan, R. F.
Holmes, Graham
Hunneford, J. N.
McCormick, W. J. M. (Paras)
*McIlroy, G.
Mackay, Allan
Mackay, Robert
Maclachlan, G. K.
McMiller, F. H.
Machin, J. H.
Melrose, D. R.
Muir, John
Park, R. C.
Parker, W. H.
Philip, J. G.
Smith, G. F.
Snalam, H. E. (Path)
*Spence, Tom
Stuart, Peter
Tallantire, I. W.
Watson, A. H.
Wauchob, R. D.
Young, Arch.
Zweig, J.

* Denotes 2nd class hoonurs.
(Paras) Denotes credit in Parasitology.
(Path) Denotes credit in Pathology.

FINAL YEAR:

Bargh, G. R.
Black, N. M.
Brotherstone, J. G.
Cameron-Stephen, I. D.
Campbell, J. D.
Colson, H. W.
Comline, R. S.
Davies, D. R. T.
Forster, John
Gammack, K. C.
Gillespie, A. C.
Grant, J. G. D.
Greig, W. A.
Hamilton, James
Hanson, B. S.
Harper, W. O.
Hogg, A. H.
Houston, T. H.
Keswani, D. G.
Lamont, H. A.
Lang, James
Lindsay, George
Littler, L. P.
Macdonald, D. M.
Macdonald, D. W.
McGirr, J. L.
Marshall, W. S.
Massey, R.
Moring, C. A. B.
Mulki, F.
Newsam, J.
Oliver, D. F.
Proverbs, M. B.
Robinson, C.
Smith, James
Tait, W. (M)
Wolfe, T. B.
Zweig, J.
Zlotnik, I.

(M) Denotes credit in Medicine.

QUESTIONS IN PARLIAMENT

Livestock (Insemination Experiments)

Mr. Granville asked the Minister of Agriculture whether he will now sanction the Devereux experiments in insemination at Kimble, in view of the fact that the standards of Reading and Cambridge have been complied with and commitments on equipment have been made?

Mr. Hudson: Pending the powers I hope to obtain from Parliament enabling me to exercise proper control, I deprecate the establishment of artificial insemination schemes.

. . . . .

Colonial Research Committee

Captain Peter Macdonald asked the Under-Secretary of State for the Colonies whether he is aware that the four scientists appointed to the new Colonial Research Committee are all individuals with a large number of other commitments vital to the war effort; whether he intends this committee to engage on continuous and active work; and whether he will set up a sub-committee of men who can give whole-time service to the scientific colonial survey which is required?

The Under-Secretary of State for the Colonies (Mr. Harold Macmillan): I think that I should make the position clear to my hon. and gallant Friend. My Noble Friend is looking to this Committee for the general supervision and inspiration of Colonial research, and not for detailed work. There are already bodies and organisations available to advise and assist in the carrying out of research in particular subjects, and I have no doubt that the Committee will make full use of such agencies and will not hesitate to recommend the establishment of sub-committees or any other new machinery which may be required.

Captain Macdonald: Will the right hon. Gentleman give an assurance that whatever committees are appointed to carry out these researches will be able to devote sufficient time to their labours, in order to achieve useful results?

Mr. Macmillan: Yes, because as I said in my reply, the function of this Committee is to organise research and to place it in the correct quarters, not to carry it out itself.

Captain Macdonald: Will the right hon. Gentleman set up another committee to explain the work of this Committee?

Mr. Macmillan: I would like to make this clear; it is an important matter. The proper way of carrying out research is not to set up rival organisations to existing bodies, but rather to organise the placing of research in the proper quarters where it can be carried on. That is the function of this Committee, to organise and manage the carrying-on of research by other agencies.

. . . . .

Poultry Reduction Scheme

Sir H. Williams asked the Parliamentary Secretary to the Ministry of Food whether, in view of the shortage of poultry food it is proposed to revert to the production of white flour, so as to make more offals available for poultry foods?

The Parliamentary Secretary to the Ministry of Food (Mr. Mabane): No, Sir.

Colonel Carver asked the Minister of Agriculture whether the new poultry reduction scheme originated with his Department; whether it was submitted before notification to any organisation closely identified with the poultry industry; and whether he will give the names of such bodies and the nature of their comments on the proposal?

The Joint Parliamentary Secretary to the Ministry of Agriculture (Mr. T. Williams): A revision of the scheme for rationing feeding-stuffs for domestic poultry was necessitated by the exigencies of the supply position. The method of effecting the reduction was worked out in my right hon. Friend's Department in consultation with other Departments concerned. The decision to put the revised scheme into operation was made after the Domestic Poultry Keepers' Council and the Scottish Gardens and Allotments Committee had been given an opportunity of expressing their views on it.

. . . . .

Horse-racing (Totalisator Receipts)

Viscountess Astor asked the Home Secretary the totalisator receipts for the years 1938, 1939, 1940 and 1941 for dog-racing and horse-racing, respectively?

Mr. H. Morrison: The total receipts at totalisators on horse racecourses during these years were as follows:—

1938	9,093,482
1939	6,953,795
1940	1,412,379
1941	2,237,456

I regret that corresponding figures of receipts at dog-tracks are not available.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

July 29th.—Meeting of the Midland Counties Division, N.V.M.A., at Birmingham, 2.30 p.m.

July 30th.—Meeting of the North of England Division, N.V.M.A., at Darlington, 3 p.m.

July 31st.—N.V.M.A. Council and Committee Meetings at the Royal (Dick) Veterinary College, Edinburgh.

July 31st.—Annual General Meeting of the Sussex Division, N.V.M.A., at Brighton, 2.30 p.m.

July 31st.—Meeting of the Royal Counties Division, N.V.M.A., at Reading, 3 p.m.

Aug. 5th.—Meeting of the Western Counties Division, N.V.M.A., at Exeter, 2 p.m.

Sept. 20th.—Entries for Miss Aleen Cust Veterinary Research Scholarship (R.C.V.S.).

* * * * *

PERSONAL

Birth.—On July 10th, 1942, at "Mountblair," Old Scapa Road, Kirkwall, to Helen, wife of Arthur Skea, M.R.C.V.S., a son.

. . . . .

Marriage.—Worden—Murray.—On July 18th, 1942, at St. Bene't's Church, Cambridge, by the Rev. E. E. Raven, M.A., Dean of St. John's College, Alastair Norman Worden, B.A., B.Sc., M.R.C.V.S., only son of Dr. and Mrs. C. N. Worden, East Barnet, Hertfordshire, to Agnes Marshall Murray, only daughter of Mr. and Mrs. J. B. Murray, Shawlands, Glasgow. The bride was given away on behalf of her parents by Dr. Joseph Needham, F.R.S., and Dr. Bernard Heydon was best man.

. . . . .

Forthcoming Marriage.—The engagement is announced between 2/Lt. P. H. Blampied, R.A., younger son of Mr. and Mrs. H. J. Blampied, of Guernsey, and Anne, only daughter of Mrs. A. Wood, Westbourne, Bournemouth.

* * * * *

NEED FOR CENTRAL SCIENTIFIC DIRECTION OF THE WAR EFFORT

On Thursday of last week the Government were asked by an influential deputation of scientists, M.P.s and peers representing the Parliamentary and Scientific Committee to set up a full-time scientific and technical joint board. This would have as its aim the fullest strategic use of scientific man-power and resources and the proper organisation and exchange of scientific and technical information relating to the war effort. The deputation was received by Mr. R. A. Butler, M.P., Chairman of the Scientific Advisory Committee.

One of the points about which some members of the deputation feel keenly is that young scientists of ability should be given more encouragement to exercise their inventive faculties.

Those who spoke were:—

Lord Samuel, Captain Leonard Plugge, M.P. (Chairman of the Parliamentary and Scientific Committee), Dr. W. Wooldridge, President, National Veterinary Medical Association—(Hon. Secretary), Mr. G. S. Garland (British Association of Chemists), Professor W. Makower (Institute of Physics), Sir Lawrence Bragg, Professor B. W. Holman, Mr. Gower Pimm (Institute of Structural Engineers), Professor Bernal (Association of Scientific Workers), Colonel Thompson (President of the Institution of Mechanical Engineers), Mr. J. H. Wootton-Davies, M.P., Lord Pentland, Mr. Hugh Linstead, M.P., Mr. R. B. Pilcher (Institute of Chemistry) Lord Leverhulme, and Lord Hinchingbrooke, M.P.

Captain Plugge said that it was in general agreed that there was abundant evidence of the need to set up without delay some form of central technical and scientific general staff to ensure that the scientific and technical resources of departments and industry are properly and effectively used in the war effort. The Parliamentary and Scientific Committee had welcomed—with reservations—the establishment of the Scientific Advisory Committee, the Engineering Advisory Committee and the attachment of many distinguished technical and scientific individuals in the capacity of advisers to all Government departments, not omitting the Prime Minister's own scientific adviser. Despite all this advice, however, it still seemed that there was insufficient co-ordinated and strategic use of the technical man-power and resources at our disposal. There was, it appeared, room for the far more effective linking up of production with operational research actually on the field of battle.

The deputation would like to see some determined effort to set up without delay a Central Scientific and Technical organisation

which would bring together all the essential information which is available to link up the scientific and technical direction of the departments connected with war and to influence the War Cabinet and the Chiefs of Staff Committee as necessary in these matters. A central organ, possessing a high degree of authority, was required to inspire the scientific and technical direction of this war.

Professor Bernal said that more use should be made of the scientific organisations and technical institutions already in existence; mobilisation and proper allocation of personnel was dependent upon some authoritative body such as that desired by the Committee.

Mr. Wootton-Davies felt that too much was left to the scientific advisers in single departments and their efforts were wasted through overlapping and lack of concentration.

Dr. Wooldridge felt that because scientists at the present time were too often used only in an advisory capacity, there was unnecessary delay in putting their ideas into effect. Administrators lacked scientific training and thus it was urgently necessary to ensure that the scientific advice is given and acted upon nearer the top. What was wanted was a full-time technical and scientific Board, so that members would not have to rush from one job to another as was the case with members of the advisory committees to-day.

Lord Hinchingbrooke strongly supported the views which had been expressed elsewhere by Dr. A. V. Hill. There was a lack of the application of scientific methods in the Army: the whole scientific staff at the centre should be extended.

Mr. R. A. Butler promised to pass on to the Lord President of the Council and the Minister of Production the views which had been expressed. He was very grateful to the Institutions for the help they offered. He would like to be clear whether the Central Body for which the Deputation asked should merely co-ordinate or whether it should have some executive powers.

In the discussion which followed it was generally agreed that the main purpose was to avoid overlapping and to stimulate co-ordination, but not necessarily to interfere with departmental activities. It was, however, vitally necessary to have an authoritative central technical and scientific Joint Board which would have close and continual access to the highest authorities, such as the War Cabinet and Chiefs of Staff Committee. A small Board with a larger panel of advisers would seem to be indicated.

* * * * *

RUBBER BOOTS: "BUYING PERMIT" AND COUPONS NOW REQUIRED

The Association is advised by the Ministry of Agriculture and Fisheries that, owing to the serious shortage of supplies of rubber, it has become necessary for the Board of Trade to exercise stricter control in regard to the sale of rubber boots and, in this connection, the Board has withdrawn the facilities under which veterinary surgeons in agricultural practice could obtain from the Department certificates enabling them to acquire such boots without having to surrender any clothing coupons. It is now necessary to obtain a "buying permit" for such boots and, in sending the permit to the retailer, a veterinary surgeon must enclose therewith two or four of his personal clothing coupons, according to the class of boot he requires. Rubber boots of knee, three-quarter or thigh lengths require four coupons per pair, but rubber knee boots with canvas tops may be obtained for the surrender of two coupons per pair.

A veterinary surgeon in agricultural practice in England or Wales who requires rubber boots may obtain a "buying permit" from the Ministry, but owing to the necessity for reducing as far as possible the consumption of rubber, the total number of such permits which the Ministry may issue is strictly limited.

In order to make the fullest possible use of available supplies of rubber, it is essential that worn rubber boots should be repaired if possible instead of being replaced with new ones. A comprehensive repair scheme for rubber boots has been established by the Rubber Control and most boot repairers know or can ascertain where rubber boots can be sent for repair. In any case of difficulty in this matter, the address of the nearest local repairer of rubber boots may be ascertained from the Secretary, National Association of Shoe Repairs Factories, 494, Great West Road, Lampton, Hounslow, Middlesex. It will be realised that a considerable extension of the "life" of rubber boots may be effected if they are used only when such wear is essential and if they are sent for repair before they become badly worn.

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FOOT-AND-MOUTH DISEASE: MINISTRY'S SWILL WARNING TO FARMERS

In a recent announcement the Ministry of Agriculture states that outbreaks of foot-and-mouth disease have occurred during the last few weeks in a number of separate areas in various parts of England and Wales. In almost every case the original outbreak of disease has been associated with the use of swill on the farm, the disease first appearing among pigs fed on swill or among cattle on farms where swill was used for feeding pigs. These outbreaks may be attributed to feeding unboiled or improperly boiled swill or else to the communication of infection in some way or other to animals from the swill before it was boiled.

Swill must be rendered safe by boiling before it is fed to animals or before they can have contact with it. It must be boiled on the farm unless it is obtained from any of the authorised plants for the treatment of swill which have been set up in many of the large centres of population. Where possible, the purchase of treated swill is recommended, since in this way the risk is avoided of infection being communicated to the animals before the swill has been rendered safe by boiling. No outbreak of the disease has been associated with the use of swill obtained from an authorised treatment plant.

Farmers should enquire of the Borough Engineer or Cleansing Superintendent at the Town Hall of any nearby town whether treated swill (boiled or concentrated) is available. Concentrated swill may also be obtainable through local corn merchants.

The feeding of unboiled swill or allowing animals access to it is a statutory offence. Swill feeders must realise that neglect of these very necessary precautions, involving as it does the risk of a serious spread of disease, constitutes a real menace to the nation's food supplies.

Stock-owners, swill feeders and others are also reminded of the importance of reporting immediately any suspicious signs of the disease among their stock, since early reporting is essential to enable the necessary measures to be taken for preventing the spread of the disease. In particular, pig keepers must regard lameness among their pigs as justifying suspicion of the existence of the disease.

* * * * *

Foot-and-mouth disease has been reported in ten English counties and in Wales. Outbreaks have occurred in Gloucester, Wiltshire, Cornwall, Lincolnshire, Devon, Leicestershire, Nottinghamshire, Norfolk, Somerset, Yorkshire and Wales.

* * * * *

DAIRY CATTLE DISEASES CONTROL SCHEME IN SCOTLAND

Delegates from a number of Associations and Societies who had expressed their special interest in the scheme for the Control of the Major Diseases of Dairy Stock had the opportunity of voicing the views of their respective organisations when they were received recently by the War Committee of the N.F.U. and Chamber of Agriculture for Scotland. This course was decided upon by the Committee after they had considered requests for the representation of the bodies concerned at the conference which it is hoped shortly to arrange with the Highland and Agricultural Society, the Milk Boards, and Scottish members of the National Veterinary Medical Association. The War Committee agreed that to open up the scope of the conference in the manner suggested would lead to duplication, which might impede discussion. They therefore invited members of the Association and Societies to attend a War Committee meeting in order that their ideas on the scheme could be ascertained and the Union and Chamber would thereafter be in a better position to act on behalf of farmers as a whole.

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PREVENTION OF DISEASE: STUDY OF SOCIAL MEDICINE

The Nuffield Provincial Hospitals Trust, with the approval of Lord Nuffield, is to devote £10,000 a year for ten years to the creation in Oxford University of a University Professorship of Social Medicine, and the foundation of an institute in which the Professor will work.

The purposes of the institute are:—

To investigate the influence of social, genetic, environmental and domestic factors on the incidence of human disease and disability.

To seek and promote measures, other than those usually employed in the practice of remedial medicine, for the protection of the individual and of the community against such forces as interfere with the full development and maintenance of man's mental and physical capacity.

If required by the university to do so, to make provision in the institute for the instruction in Social Medicine of students and practitioners of medicine approved by the Board of the Faculty of Medicine in the University of Oxford.

There will be an administrative committee for the institute on which the trust will be represented by six members. In this way co-operation will be furthered between the institute and other research institutions established elsewhere by the trust.

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The death is reported of Mrs. Stanton, Snelston Hall, near Ashbourne, first woman President of the Shire Horse Society (1927) and of Ashbourne Shire Horse Society. One of her most successful stallions was the noted Harboro Nulli Secundus which won the King's Cup outright at the Shire Show in London. He was supreme champion in 1922 and 1923.

ATTENUATED GOAT VIRUS IN RINDERPEST

Mr. G. Mayall, M.R.C.V.S., Bolton, forwards the following extract from a letter received by him from Mr. W. Gordon Pevie, Veterinary Officer, Tanganyika Territory, writing from Mpwapwa:—

"We have been inoculating against rinderpest, using an attenuated goat virus, and have been blessed with remarkably good results. It was a tremendous task with the heat, then the rain and wind. However, it is a vastly superior method of immunisation to the old cumbersome method, using either vaccine serum or virus serum.

"The work out here is hard and vast, *e.g.*, one V.O. with the help of four European stockmen is in charge of a cattle population of nearly 2,000,000."

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

* * * * *

SCHEME FOR THE CONTROL OF THE MAJOR DISEASES OF DAIRY CATTLE

Sir,—Can we really say that the above scheme has made a "promising start"? I have before me the numbers of farms "enrolled" in this country up to the end of June and, to me, it makes sorry reading. Our grand total in this county is nine—less than one per veterinary surgeon—and I must say that considering the preliminary publicity that the scheme received in the public, agricultural and veterinary Press, I have found a distinct lack of enthusiasm amongst the farming community and the veterinary profession. Everyone thinks it is "a good idea" and a step in the right direction, but it is my considered opinion that, looking at it from a national point of view, the scheme will never attain its objective unless it is made compulsory and is solidly backed and subsidised by the Government. A common remark that one hears is, "Why should I go into this when my neighbours carry on in the same old way. Now if it were made compulsory . . ." There is no doubt that never were the farming community more ready to accept compulsory veterinary supervision than they are to-day.

A suggested scheme would be—compulsory enrolment of all farmers (each farmer, of course, to choose his own "panel doctor"). Then each farmer to pay to the Government department concerned, so much per head on all breeding stock—to be based on his previous official return of stock on the farm. The Government then to pay the veterinary surgeons. In this way the whole of the breeding cattle of this country would *immediately* receive regular inspection and treatment (with *immediate* improvement in the milk and beef production of the country), instead of the small percentage that will enrol voluntarily, with consequent little effect on our national food supply.

Possibly the "Numbers of Undertakings" under the scheme will show a hearty jump this month, but I feel no signs of it in this district at the moment. I am in no way belittling the efforts of those gentlemen who have put in such a vast amount of work in formulating the present scheme, but I do urge that the scheme should be made compulsory and entirely run and financed by the Government. Don't let us have another "N.A.R.P.A.C."

Yours faithfully,

J. V. S. Rutter.

Veterinary Infirmary,
Gwynne House, Hereford.
July 16th, 1942.

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THE TOXICITY OF PHENOTHIAZINE

Sir,—On re-reading recently Dr. E. L. Taylor's annotation on phenothiazine poisoning, with special reference to reports of its occurrence in horses (*Vet. Rec.*, February 28th, 1942. **54**. 9. p. 96), it occurs to me to suggest that there may possibly be two or more distinct types of toxic reaction involved, which should be considered separately.

One appears to be the interesting occurrence of an apparent group sensitivity among certain horses to the drug, and which may as suggested indicate a nutritional influence, and possibly bears some analogy to carbon tetrachloride poisoning in sheep. This form of toxicity seems to me to be typically exemplified by the report of Hatcher referred to by Taylor on page 96.

The second type of toxic reaction I would like to suggest is an acute haemolytic anaemia of chemical origin, such as has been recorded on many occasions with drugs of the sulphonamide group in human patients, and recently in a horse with sulphanilamide (Dickinson, 1942. *Vet. Rec.* **54**. 23. June 6th. p. 224). A typical example of this form of toxic reaction appears to be that of Wolfe and Dennis, quoted by Taylor on page 97, and possibly also the Third Example in Great Britain on page 97.

It may, therefore, not be out of place to record here briefly the salient features of haemolytic anaemia in man due to chemotherapeutic drugs which, it should be noted, are not totally unrelated in their chemical structure to phenothiazine.

1. The reaction occurs usually about three days after commencing administration.
2. The haemolysis is usually progressive unless—
3. The process is arrested by blood transfusion. This is the only therapeutic measure of any value apart possibly from the forcing of fluids to promote rapid elimination of the drug.
4. There is frequently an associated leucocytosis or hyperleucocytosis.
5. In a high proportion of cases, the patient is sensitised to the drug so that should the same, or possibly a closely related compound be given on a subsequent occasion after recovery, there is every likelihood of the recurrence, immediately, instead of after three days' administration, of the haemolytic anaemia.
6. The occurrence of the reaction bears little relationship to dosage, but appears to be favoured by repeated administration.

Acute haemolytic anaemia from phenothiazine has also been reported in man. It appears to have occurred in a relatively high proportion of cases, but it should be noted that in man the drug has been given by repeated administration which would favour the development of sensitisation of which this acute haemolytic anaemia would appear to be a form. In the case of horses, on the other hand, a single dose is the rule.

It would, therefore, be useful evidence if practitioners who have the opportunity could confirm, or refute, whether horses which have exhibited evidence of a degree of haemolysis due to phenothiazine, and which have recovered, do, when given a second dose at a later date, show the same reaction, possibly in an even more severe degree.

In conclusion, one feels constrained to lament in so many veterinary case reports the absence of adequate evidence in the form of biochemical and cytological investigation of the blood and urine examination, as well as detailed *post-mortem* features. In this, it must be recognised we are far behind the medical profession, and while one recognises the difficulties in the way of adopting elaborate and often expensive methods of diagnosis, it is nevertheless desirable that progress should be made in this direction.

Yours faithfully,

M. H. Weddell, M.R.C.V.S.

Veterinary Department,
Pharmaceutical Specialities (May & Baker), Ltd.,
Dagenham.
July 13th, 1942.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV)

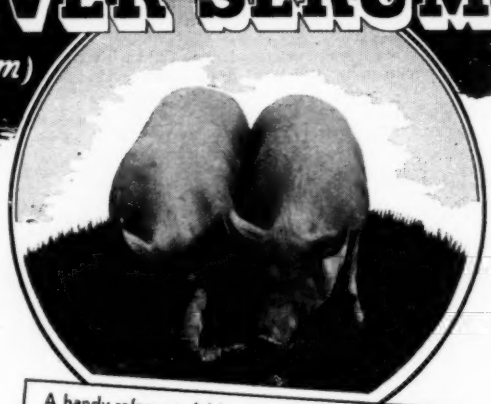
Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
June 1st to 15th, 1942	13	6	—	1	29
Corresponding period in—					
1941 ...	21	2	—	2	37
1940 ...	10	1	—	—	228
1939 ...	22	9	2	—	131
Total Jan. 1st to June 15, 1942	157	22	26	116	215
Corresponding period in—					
1941 ...	265	255	8	131	761
1940 ...	270	19	14	115	1,895
1939 ...	423	38	30	147	896

Note.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

SWINE FEVER SERUM

(Anti-Virus Swine Fever Serum)



Obtained from pigs hyper-immunised by repeated inoculations with virulent blood from pigs suffering from swine fever.

For the protection of healthy herds and for emergency and curative treatment in outbreaks of virus swine fever.

Swine Fever Serum (Anti-virus) is supplied in bottles of 100 c.c. and 250 c.c.

Produced in the U.S.A. under the permanent control of the United States Bureau of Animal Industry.

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A handy reference folder entitled 'Differential Diagnosis' (comparing the symptoms of Swine Erysipelas, Virus Swine Fever, Swine Paralyphoid, Swine "Plague" and Enzootic Pneumonia) will be gladly forwarded to veterinary surgeons on request.

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